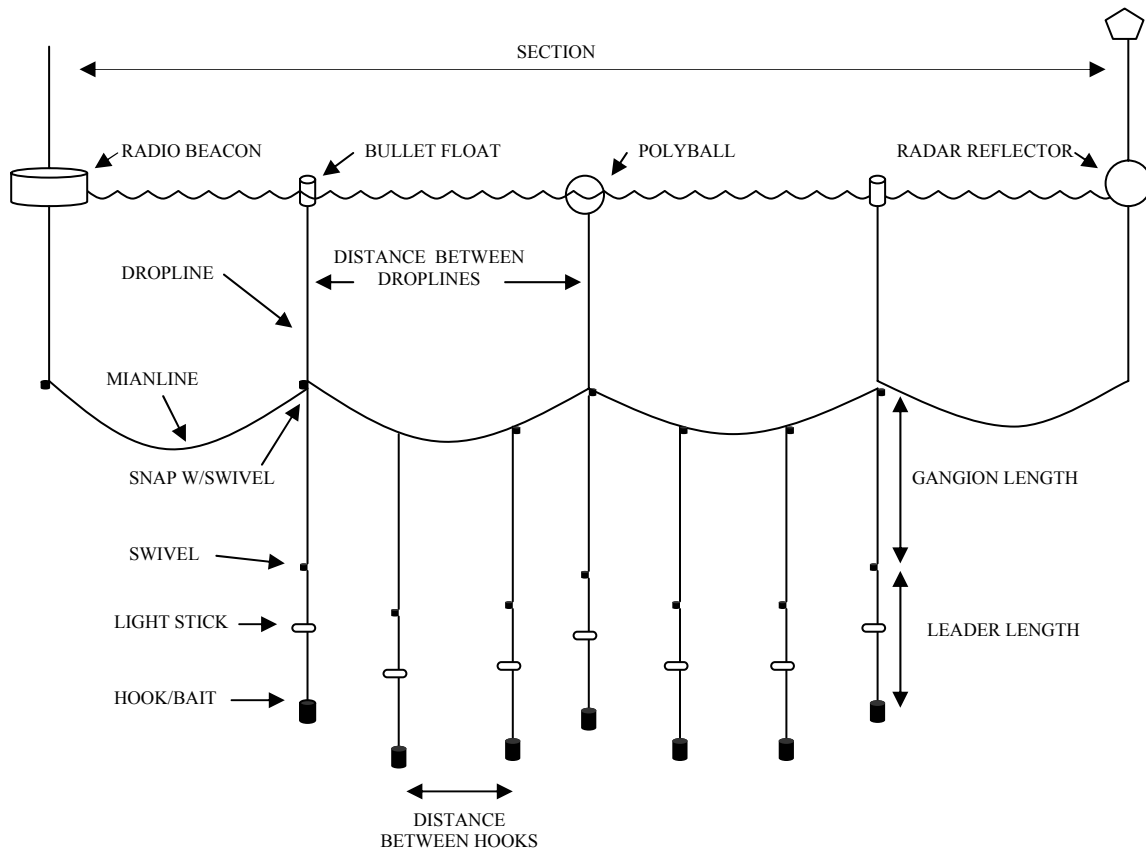The following is data documentation for gear log records collected by the Pelagic Observer Program (POP) of the Southeast Fisheries Science Center (SEFSC) for the U.S. pelagic longline fleet. The data also includes records collected by the Northeast Fisheries Science Center (NEFSC) as part of their sea sampling program; in 1999 data collected by the NEFSC on board U.S. pelagic longline vessels were added to the POP database by incorporating the data fields that were common to both databases. At that time efforts were made to ensure that the information was collected in a consistent manner; however the user should understand that this documentation is based on POP protocols, standards, training, and institutional memory, which may vary somewhat from those of the NEFSC. NEFSC data represents about 11% of the trips observed.

Below, each data field is explained in detail sufficient for most user's needs. Additional information on the POP; including observer training materials, technical memoranda, and POP staff contact information, can be found on the POP website at www.sefsc.noaa.gov/pop.jsp

Definitions:

The following data fields refer to gear configuration and specification information collected by the observers on the GEAR LOG form. Below is a diagram of a "section" of pelagic longline gear, with definitions of the parts. Note the diagram is not to scale or very representative of normal fishing effort, many more hooks and floats are normally found in a section.

SECTION

RADIO BEACON   BULLET FLOAT   POLYBALL   RADAR REFLECTOR

DROPLINE

DISTANCE BETWEEN DROPLINES

MIANLINE

SNAP W/SWIVEL

GANGION LENGTH

SWIVEL

LIGHT STICK

LEADER LENGTH

HOOK/BAIT

DISTANCE BETWEEN HOOKS

TRIP_NUMBER

This is 3-6 character field that identifies a single observed trip. "Observed trips" are defined as an observer spending time at sea on the vessel, regardless of whether or not the vessel conducted any fishing operations. For example, if a vessel departs the dock, and returns after 2 days due to a hydraulic failure without ever deploying fishing gear, and due to logistical considerations the observer does not re-embark on the vessel after the repairs are made, this is still considered a "trip" and is assigned a trip number. However, trips with no fishing activity do not appear in the database. This explains skips in otherwise consecutive trip numbers (e.g. ..M14, M15, M17…).

TRIP_NUMBER (sometimes referred to as trip ID number)is used to relate all records collected during a single trip together. It is found on all observer logs and forms. Trip numbers for SEFSC observers were originally 3 characters long and constructed by assigning an alphabetic letter to an individual observer who would then use that letter plus the sequential two digit number trip to create the trip ID number (e.g. P01, P02, P03…..etc.). By 2000 there had been sufficient turnover of observers that all letters of the alphabet had been assigned; therefore a 6-character TRIP_NUMBER was implemented. Observers already in the system kept their alphabetic identifier, but added a numeric portion (e.g. "P" became "P01") and the sequential trip number was increased to three characters (e.g. …P50, P51, P01052, P01053,….). Where alphabetic letters were reused, distinctions between different observers were made by the numeric portion of the observer identifier (e.g. D03001 and D04001 were two separate trip made by two separate observers).

NEFSC trip ID numbers followed a different system and sorting trips by individual observers cannot be done. NEFSC trips can be identified as those trips where the TRIP_NUMBER is greater than three characters long, during the time period 1992-1999. In 2000 trips A25006, B49004, B56038, and B48023 were conducted by NEFSC observers. After 2000, no trips were conducted by NEFSC observers.

LANDING_DATE

LANDING_DATE is the month, day, and year that the vessel returned to the dock. It may not be the same day the fish were actually sold. For example, if a vessel returns to the dock at 2000 hrs on 01/15/2003 and unloads the next morning at 0700 hrs on 01/16/2003, the LANDING_DATE is 01/15/2003. This can cause some confusion when trying to link observed trips to reported logbook and landings information because fishermen and dealers frequently consider landing date as the date the vessel was unloaded.

STRING_NUMBER

Generally, one gear log can be used to describe the fishing gear used within a trip. However, a change in gear configuration (e.g. use of lightsticks, hooks between floats, fishing depth) that redirects towards another

target species require another gear log. Different gear logs within the same trip are differentiated by STRING_NUMBER. The numeric values in the gear data reflect an average of all hauls with the same string number.

Example: The first two hauls of a trip use light sticks and direct towards swordfish are described by string number 1. The remaining five hauls do not use light sticks and target tuna. The observer would fill out another gear log labeled as string number 2. STRING_NUMBER is also found in haul information and can be used to link a particular haul to a particular gear configuration.

It should not be assumed that if multiple string numbers occur during a single trip, that "String 1" represents the gear type used most frequently during the trip. String numbers are assigned in the order that the gear configuration that string number represents is used during the trip. For example, if a vessel sets at night using light sticks for the first set (string 1, SWO target), and then adds short gangions to every float to hopefully catch dolphinfish as well as swordfish for the next set (string 2, MIX target), but then changes to day setting with no lightsticks or short gangions for the next 8 sets (string 3, TUN target); using string 1 to describe the gear for the entire trip would be inappropriate.

Due to file conversion difficulties, most of the trips conducted by the NEFSC have a STRING_NUMBER value of zero rather than a null value. It can be assumed that a zero in the STRING_NUMBER field means only one gear configuration was used during the trip.

NUMBER_HOOKS

This is the **average** number of hooks set during hauls with the same gear configuration (i.e. string number).

ANCHOR_USED

Indicates if an anchor was used, 0 = no, 1 = yes. This data field is included in order to give the observer's forms and the POP database the ability to accommodate observation of bottom longline sets. "Anchor" is defined as an object that holds the bottom in order to fix gear in

place. Thus, the use of sea anchors or weights that do not come in contact with the bottom and are occaisionally used during pelagic longline operations to slow the drift of the gear is not indicated by this field. There are currently no trips in the POP database where an anchor is used.

ANCHOR_WEIGHT

  If the ANCHOR_USED field = 1, the weight of the anchor expressed to the nearest pound should be entered. See explanation for ANCHOR_USED. Due to file conversion difficulties, some values in this field are NULL values and others are zero.

MAINLINE_COLOR

    Indicates the color of the mainline using the following codes:

01 = CLEAR
02 = WHITE
03 = PINK
04 = BLACK
05 = GREEN
06 = BLUE
07 = MULTI-COLOR
08 = RED
09 = OTHER

    If more than one color of mainline is present (this occurs commonly when splices exist) the value 07 (multicolor) will appear in this data field. In this case it may be impossible to tell from the database what different colors were used; however it is possible this information may appear in the COMMENTS field for this string number, along with a ratio of the colors used. If a single color is used that does not fit into one of the given colors, 09 (other) will appear in the field and should be described in the COMMENTS field for this string number.

MAINLINE_STRANDS

This is the number of strands that make up the mainline. In monofilament longline gear, this number is always 1. Currently all trips in the POP database indicate that single stranded monofilament mainline was used.

MAINLINE_DIAMETER

This value is the diameter of the mainline expressed to the nearest tenth of a millimeter. In most cases this value is either taken as a caliper measurement by the observer or from the manufacturer's label. In some cases an actual measurement was not taken; the captain's information of the pound breaking test was used to estimate the mainline diameter. General ranges are from 3.0 to 4.2 mm.

MAINLINE_STRENGTH

This field is also referred to as "test", i.e. the tested weight (in pounds) at which the line breaks. In general this information comes from the manufacturer's label or from the captain, but in some cases it is estimated from the mainline diameter. General ranges are from 600-1000 lbs.

As a general rule, the greater the diameter the greater the breaking strength; however recent advances in chemical engineering have resulted in higher test strength in smaller diameters.

MAINLINE_MATERIAL

This field indicates the material that the mainline is constructed of. Four values are possible in this field:

Nylon = 1
Cotton = 2
Steel Wire = 3
Other = 9

"Other" should always be described in the COMMENTS field. This data field is included in order to give the observer's forms and the POP database the ability to accommodate observation of bottom longline sets. The modern US pelagic longline fleet uses nylon monofilament almost exclusively (MAINLINE_MATERIAL = 1).

WERE_POLYBAL_FLOATS_USED

This field indicates whether polyballs (inflatable soft plastic floats) were used in the gear; NO = 0, YES = 1

NUMBER_POLYBAL_FLOATS

This field indicates the **average** number of polyball floats used in the gear if the preceding field is "1". If no polyballs were used this field may either be "0" or a null value.

WERE_BULLET_FLOATS_USED

This field indicates whether bullet floats (closed cell foam floats shaped like bullets, also known as daubs) were used in the gear; NO = 0, YES = 1

NUMBER_BULLET_FLOATS

This field indicates the **average** number of bullet floats used in the gear if the preceding field is "1". If no bullet floats were used this field may either be "0" or a null value.

WERE_OTHER_FLOATS_USED

This field indicates whether other floats were used in the gear; NO = 0, YES = 1. If this field = "1", what these floats are should be explained in the COMMENTS field. The most common "other" floats used in the pelagic longline

fishery are hard (non-inflatable) plastic balls, sometimes referred to as "japanese" balls.


NUMBER_HOOKS_BETWEEN_FLOATS

This field indicates the maximum number of hooks between bullet floats, and represents an average of all hauls with the same string number. Some explanation of this field is needed due to two possible ways pelagic longline fishermen configure their gear. In one possible configuration, gangions are not placed directly under bullet floats/droplines, and the number of hooks between floats is clear.

Example, 4 hooks between floats:
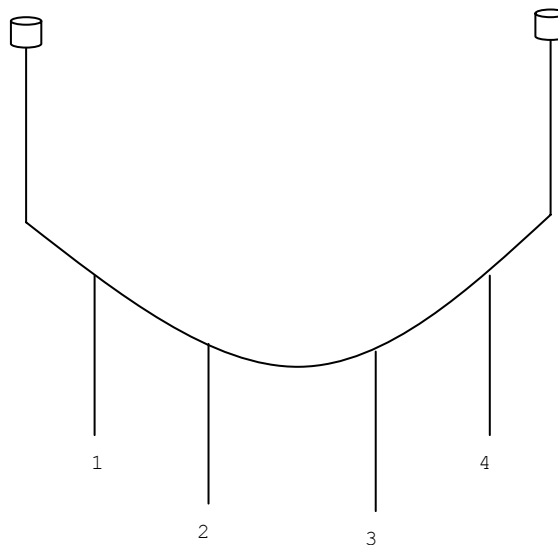
However, more commonly a gangion is placed directly underneath a dropline/bullet float. In this case only one of the hooks underneath a dropline is counted in the hook between float count.

Example, 4 hooks between floats:
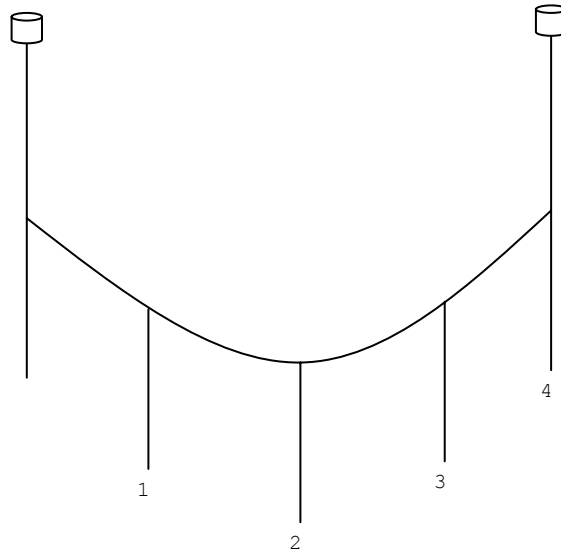
NUMBER_RADIO_BEACONS

   Indicates the **average** number of radio beacons used
during all hauls with this string number. Radio beacons
may also be called "radio buoys" or "beepers" and emit
radio signals that allows direction finding equipment on
the fishing vessel to locate drifting gear.

NUMBER_RADAR_REFLECTORS

      Indicates the **average** number of radar reflectors used
during all hauls with the same string number. Radar
reflectors are also commonly referred to as "high fliers",
and show up as targets on the vessel's radar screen,
enabling the vessel to locate drifting gear.

NUMBER_SECTIONS

   Indicates the number of sections used; this is an
average of all hauls with the same string number.   A
"section" is defined as that length of gear between radio
beacons or radar reflectors.

DISTANCE_BETWEEN_SECTIONS

This field indicates the distance (to the tenth of a nautical mile) of an **average** section of all hauls with this string number. This field is not physically measured but is calculated by dividing the average mainline length (taken from the haul logs) by the NUMBER_SECTIONS.

WERE_LIGHT_STICKS_USED

Indicates whether light sticks were used on this string. NO = 0, YES = 1

LIGHT_STICK_COLOR

Indicates the light stick color using the following codes:

02 = White
03 = Pink
04 = Black
05 = Green
06 = Blue
07 = Multi color
08 = Red
09 = Other
10 = Yellow
11 = Purple

If more than one color light sticks are used, the value 07 (multicolor) will appear in this data field. In this case it may be impossible to tell from the database what different colors were used; however it is possible this information may appear in the COMMENTS field for this string number, along with a ratio of the colors used. If a single color is used that does not fit into one of the given colors, 09 (other) will appear in the field and should be described in the COMMENTS field for this string number.

GANGION_COLOR

Indicates the color of the gangions using the following codes:

01 = CLEAR
02 = WHITE
03 = PINK
04 = BLACK
05 = GREEN
06 = BLUE
07 = MULTI-COLOR
08 = RED
09 = OTHER

If more than one color of gangion material is used, the value 07 (multicolor) will appear in this data field. In this case it may be impossible to tell from the database what different colors were used; however it is possible this information may appear in the COMMENTS field for this string number, along with a ratio of the colors used. If a single color is used that does not fit into one of the given colors, 09 (other) will appear in the field and should be described in the COMMENTS field for this string number.

GANGION_DISTANCE

This field indicates the **average** distance, in whole feet, between gangions. This is not a physically measured value, but is calculated by dividing the average mainline length by the NUMBER_HOOKS (or by dividing average mainline length, converted to feet by NUMBER_HOOKS+NUMBER_SECTIONS+NUMBER_POLYBAL_FLOATS+NUMBER_BULET_FLOATS + NUMBER_OTHER_FLOATS), depending on which of the two different gear configurations shown for NUMBER_HOOKS_BETWEEN_FLOATS is used on this string.

GANGION_DIAMETER

This value is the diameter of the gangion material expressed to the nearest tenth of a millimeter. In most cases this value is either taken as a caliper measurement

by the observer or from the manufacturer's label. In some
cases an actual measurement was not taken; the captain's
information of the pound breaking test was used to estimate
the gangion diameter. General ranges are from 1.8 to 2.2
mm.

GANGION_STRENGTH

     This field is also referred to as "test", i.e. the
tested weight (in pounds) at which the line breaks.   In
general this information comes from the manufacturer's
label or from the captain, but in some cases it is
estimated from the gangion diameter. General ranges are
from 300-500 lbs.

As a general rule, the greater the diameter the greater the
breaking strength; however recent advances in chemical
engineering have resulted in higher test strength in
smaller diameters.

GANGION_MATERIAL

     This field indicates the material that the gangion is
constructed of. Four values are possible in this field:

Nylon = 1
Cotton = 2
Steel Wire = 3
Other = 9

"Other" should always be described in the COMMENTS field.
This data field is included in order to give the observer's
forms and the POP database the ability to accommodate
observation of bottom longline sets. The modern US pelagic
longline fleet uses nylon monofilament almost exclusively
(GANGION_MATERIAL = 1).

GANGION_LENGTH_1

          Indicates in a measurement to the nearest foot the
length of the gangion, defined as the length from the
snap/swivel combination to the swivel; or the length from

the snap/swivel combination to the hook if no swivel is used in between. If only one gangion length is used throughout all the hauls in this string, that value will appear in this field. If more than one gangion length is used, the one used most frequently should be placed in this field.

GANGION_COUNT_1

This field is an **average** and indicates how many gangions of GANGION_LENGTH_1 were used during the hauls with this string number.

WERE_LEADERS_USED_1

Indicates if leaders were used. A leader occurs when an intermediate swivel is placed between the swivel/snap and the hook. The "leader" is that part between the intermediate snap and the hook (Leaders are sometimes referred to as tails). NO = 0, YES = 1. This field refers specifically to leaders placed on gangions described in the GANGION_LENGTH_1 and GANGION_COUNT_1 fields.

WERE_SWIVELS_USED_1

Indicates if swivels were used on gangions. NO = 0, YES = 1. This field refers specifically to swivels placed on gangions described in the GANGION_LENGTH_1 and GANGION_COUNT_1 fields. Because most snaps that connect gangions to the mainline have a swivel included, this field will generally have the value 1 (YES).

NUMBER_SWIVELS_USED_1

Indicates the number of swivels used per gangion. This field refers specifically to swivels placed on gangions described in the GANGION_LENGTH_1 and GANGION_COUNT_1 fields. Generally this value will be 1 or 2.

GANGION_LENGTH_2 through **NUMBER_SWIVELS_USED_2**

In cases where more than one gangion length is used in a string, the fields GANGION_LENGTH_2 through NUMBER_SWIVELS_USED_2 should be filled out; the definitions for these fields would be the same as GANGION_LENGTH_1 through NUMBER_SWIVELS_USED_1.

LEADER_LENGTH

Indicates the length, in inches, between an intermediate swivel and the hook, where an intermediate swivel is used.

LEADER_STRENGTH

This field is also referred to as "test", i.e. the tested weight (in pounds) at which the line breaks. In general this information comes from the manufacturer's label or from the captain, but in some cases it is estimated from the leader diameter. Usually the leader is made out of the same material as the gangion, so the strengths are the same.

LEADER_MATERIAL

This field indicates the material that the gangion is constructed of. Four values are possible in this field:

Nylon = 1
Cotton = 2
Steel Wire = 3
Other = 9

"Other" should always be described in the COMMENTS field. In the POP data the leader material is almost always nylon monofilament; generally it is the same material as the gangion.

DROPLINE_LENGTH_1

Indicates the length, in feet, of the droplines (lines that connect floats to the mainline). In cases where droplines of various lengths are used throughout a set (or on different sets with the same string number), DROPLINE_LENGTH_1 should be the filled in for the numerically dominant dropline length. Proportions of the various dropline lengths used can sometimes be found in the COMMENTS field of the gear log, or in the COMMENTS field of the haul logs. Note that a change in dropline lengths does not necessarily reflect a change in target species (and thus a change in string number).

DIS_BETWEEN_DROPLINES_1

Indicates the **average** length in feet between adjacent droplines (and by extension, adjacent floats). This number is not physically measured but is calculated by multiplying GANGION_DISTANCE by NUMBER_HOOKS_BETWEEN_FLOATS; or by multiplying GANGION_DISTANCE by (NUMBER_HOOKS_BETWEEN_FLOATS + 1), depending on which of the two basic gear configurations (shown in the definition of NUMBER_HOOKS_BETWEEN_FLOATS)is used. This field is supposed to represent the distance between adjacent droplines/floats regardless of whether those droplines are the same length. Therefore, for example in strings where multiple length droplines were used, there should be different values for DROPLINE_LENGTH_1 and DROPLINE_LENGTH_2, but the values for DIS_BETWEEN_DROPLINES_1 and DIS_BETWEEN_DROPLINES_2 should be the same. The POP has noticed some inconsistencies in the database in this field. We believe that in some instances the observer interpreted this field as the distance between droplines of the same length, not necessarily adjacent droplines. An ongoing review of the data will attempt to resolve and if needed correct these issues.

DROPLINE_LENGTH_2, DIS_BETWEEN_DROPLINES_2,
DROPLINE_LENGTH_3, DIS_BETWEEN_DROPLINES_3

These fields will contain values if more than one length of dropline is used in any single string number.

Their definitions are the same as those for DROPLINE_LENGTH_1 and DIS_BETWEEN_DROPLINES_1.

HOOK_BRAND_1

Indicates the brand name of the hooks used. If multiple types of hooks are used in the same string number, HOOK_BRAND_1 should represent the numerically dominant hook. This information is taken from the manufacturer's packaging, referencing hook guides, or from the captain's information. Examples: MUSTAD, EAGLE CLAW, HI LINER, LGPN (Lindgren-Pitman).

HOOK_MODEL_1

This field indicates the hook model or pattern number. If multiple types of hooks are used in the same string number, HOOK_MODEL_1 should represent the numerically dominant hook. This information is taken from the manufacturer's packaging, referencing hook guides, or from the captain's information. In most cases values in the HOOK_MODEL field reflect the manufacturer's model number exactly; however in some cases it does not. It was the POP's policy to not use alphabetic portions of pattern numbers in this field (for example, 39660D was recorded as 39660) so in the cases that the alphabetic portion helped describe the hook (i.e. offset direction, construction material) this information is not recoverable. Further, the POP arbitrarily created some hook pattern/model numbers for hooks where the manufacturer did not assign such a number (e.g. Lindgren-Pitman circle hook made of black carbon = LPCIRBL). Contact the POP staff if there are questions regarding a specific value in any HOOK_MODEL field.

HOOK_SIZE_1

Indicates the size of the hook by industry standards. If multiple types of hooks are used in the same string number, HOOK_SIZE_1 should represent the numerically dominant hook. This information is taken from the

manufacturer's packaging, referencing hook guides, or from the captain's information. Generally the values in this field will range from 7/0 to 20/0.

HOOK_TYPE_1

Indicates the type or general shape of the hook, values can be "J Hook", "Circle Hook", or "Unknown". If multiple types of hooks are used in the same string number, HOOK_TYPE_1 should represent the numerically dominant hook. In most cases, values of "Unknown" appear in this field when the HOOK_MODEL field is null. However, data users could make assumptions of hook type based on hook size (e.g. a 8/0 hook is most likely a J hook and a 18/0 hook is most likely a circle hook). The POP suggests data users consult longline gear experts for more information on the validity of such assumptions.

HOOK_OFFSET_1

Indicates, in degrees, the angle of offset the hooks used. If multiple types of hooks are used in the same string number, HOOK_OFFSET_1 should represent the numerically dominant hook. The values in this data field are normally 0 (zero degree offset, or non-offset) or 10. This data field was implemented the Fall of 2004. Hook offset information for the previous years are generally not recoverable except in the cases where the hook pattern number reflected the offset (e.g Eagle Claw 9014, 9015, etc).

HOOK_BRAND_2, HOOK_BRAND_3, etc.

If more than one brand/model/size of hook is used for any single string number, these fields will have values. Definitions are the same as for HOOK_BRAND_1 etc.

IS_COMMENT

Indicates if the COMMENTS field is not null; "Y" = yes, "N" = no

COMMENTS

    This field is used to save information that is not captured by the other data fields but the observer or POP debriefer believes to be important. Examples of the types of information detailed in the COMMENTS field have been given above. This field may be particularly important in explaining outliers.